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Date

Signature

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Wen Tong et al.
Serial No: 09/766,267
Filing Date: January 19, 2001
Examiner: Hanh N. Nguyen
Art Group: 2662
Docket No: 11962ROUS02U
Title: FRAME STRUCTURE FOR VARIABLE RATE WIRELESS CHANNELS TRANSMITTING HIGH SPEED DATA

Date: 6/2/05

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APPEAL BRIEF

Applicants hereby file this Appeal Brief in triplicate within two months of filing of a Notice of Appeal (filed on April 2, 2005). Should the filing of this Appeal Brief not be timely, the undersigned attorney hereby petitions for an appropriate extension of time and requests that the corresponding petition fee be withdrawn from deposit account No. 50-2126.

The format of this Appeal Brief complies with Rules of Practice Before the Board of Patent Appeals and Interferences (Final Rule), 69 Fed. Reg. 49959 (August 12, 2004), effective September 13, 2004.

1. Real Party in Interest: All rights to the above referenced patent application have been assigned to:

Nortel Networks Limited
2351 Boulevard Alfred-Nobel
St. Laurent, Quebec
Canada, H4S 2A9

2. Related Appeals and Interferences: There are no known other appeals or interferences that would directly or indirectly affect the Board's decision in the present appeal.

3. Status of the Claims: Claims 1, 8, 15, and 21-24 stand rejected under 35 U.S.C. 102(e) as being anticipated by Raleigh et al. (US Pat. No. 6,463,096 B1, "Raleigh"). Claims 6 and 13 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Raleigh in view of Love et al. (US Pat. No. 6,058,107, "Love"), and further in view of Christodoulides et al. (US Pat. No. 6,665,361 B1, "Christodoulides"). Claims 3-5, 10-12, and 17-20 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Raleigh in view of Rydbeck et al. (US Pat. No. 6,332,006 B1, "Rydbeck").

4. Summary of Claimed Subject Matter:

The claims of the present application all relate to superframe structures employed in servicing high data rate wireless communications. In particular, the claims are directed the structure of a wirelessly transmitted superframe, methods for forming and wirelessly transmitting the superframe by a base station, methods for wirelessly receiving and extracting data from the superframe by a user terminal, a base station that forms and wirelessly transmits the superframe, a user terminal that wirelessly receives data carried

by the superframe, computer software instructions that, when executed, cause a base station to wirelessly transmit the superframe, and computer software instructions that, when executed, cause a user terminal to wirelessly receive the superframe.

Claim 1, for example, is directed to a method for operating a base station to wirelessly transmit data communications to a plurality of user terminals on a single wireless carrier. The base station repeatedly and sequentially wirelessly transmits time division multiplexed superframes to the plurality of user terminals. Diagram 1 illustrates one embodiment of a superframe structure according to the present application.

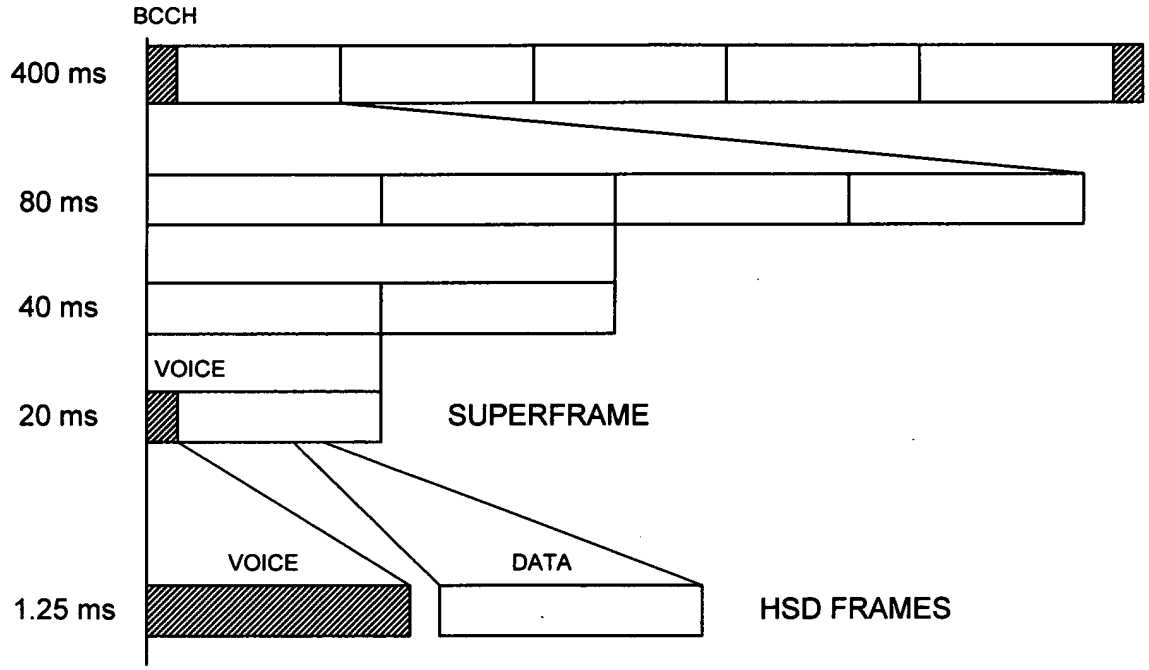

Diagram 1 - Superframe Structure (FIG. 2 of the present Application)

As shown in Diagram 1, each 20 ms time division multiplexed superframe carries a plurality of high speed data frames (HSD frames). Claim 1 requires that each of these high speed data frames carries at least one data communication and that each of these high speed data frames includes: (1) a respective indication of at least one user terminal for

which the at least one data communication is intended; and (2) a respective indication of at least one data rate of the high speed data frame.

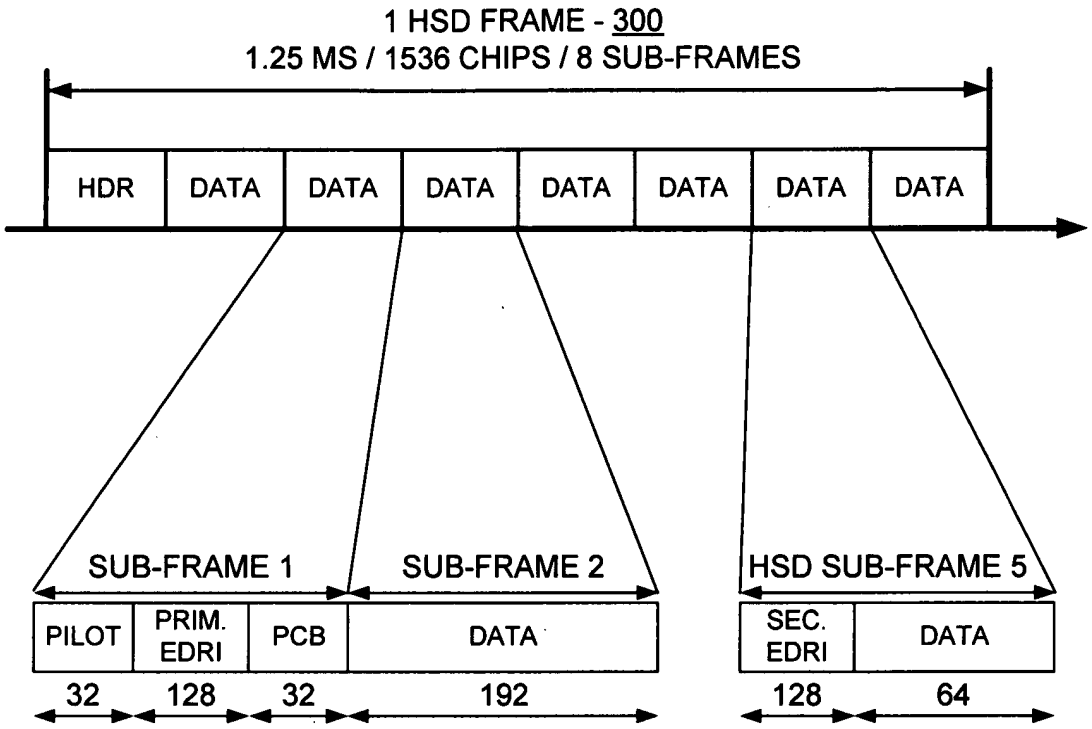

Diagram 2 - High Speed Data Frame Structure (FIG. 3 of the present Application)

Diagram 2 (FIG. 3 of the present application) illustrates one embodiment of a high speed data frame according to the present invention. With the language of claim 1 applied to Diagram 2, the "respective indication of at least one user terminal for which the at least one data communication is intended" and the "respective indication of at least one data rate of the high speed data frame" are included with of the explicit data rate indicator (EDRI). As stated in the specification of the present application at page 13, line 21 through page 14, line 4, (referring to FIG. 3 of the present application):

"The primary EDRI (and secondary EDRI, when included) provides an explicit indication of the data rate(s) for data contained in the HSD frame 300, the identities of the user terminal(s) for whom the data is intended, and the relative

position of the data within the HSD frame 300. As will be further described with reference to FIGs. 7 and 8, when the HSD frame contains both voice and data communications, the EDRI may also provide additional information relating to the voice communication. In the data only embodiment of FIG. 3, the EDRI includes a plurality of bits to indicate a data rate for the HSD frame 300, one bit to indicate that the HSD frame 300 carries data, and a plurality of bits to identify one or more user terminals for which the data in the HSD frame 300 is intended."

5. Grounds of Rejection to be Reviewed on Appeal: The applicants contend that claims 1, 8, 15, and 21-24 are not anticipated under 35 U.S.C. 102(e) by Raleigh. Applicants contend that claims 6 and 13 are not unpatentable under 35 U.S.C. 103(a) over Raleigh in view of Love, and further in view of Christodoulides. Applicants contend that claims 3-5, 10-12, and 17-20 are not unpatentable under 35 U.S.C. 103(a) over Raleigh in view of Rydbeck.

6. Argument:

Claims 1, 8, 15, and 21-24 are not anticipated under 35 U.S.C. 102(e) by Raleigh

Raleigh discloses a TDMA/FDMA frame structure that allows a plurality of Customer Premises Equipments (CPEs) to share a frequency spectrum. In making the 102(e) rejection, the Examiner relies upon FIGs. 4A and 4B of Raleigh, which are reproduced below for reference.

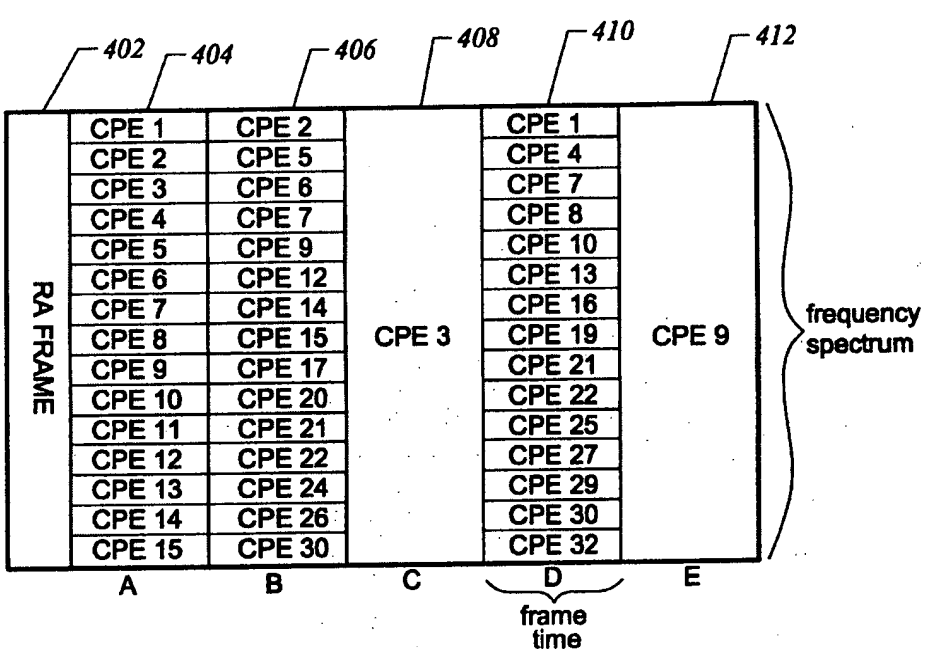

FIG. 4A

FIG. 4A of Raleigh et al., U.S. Patent No. 6,463,096

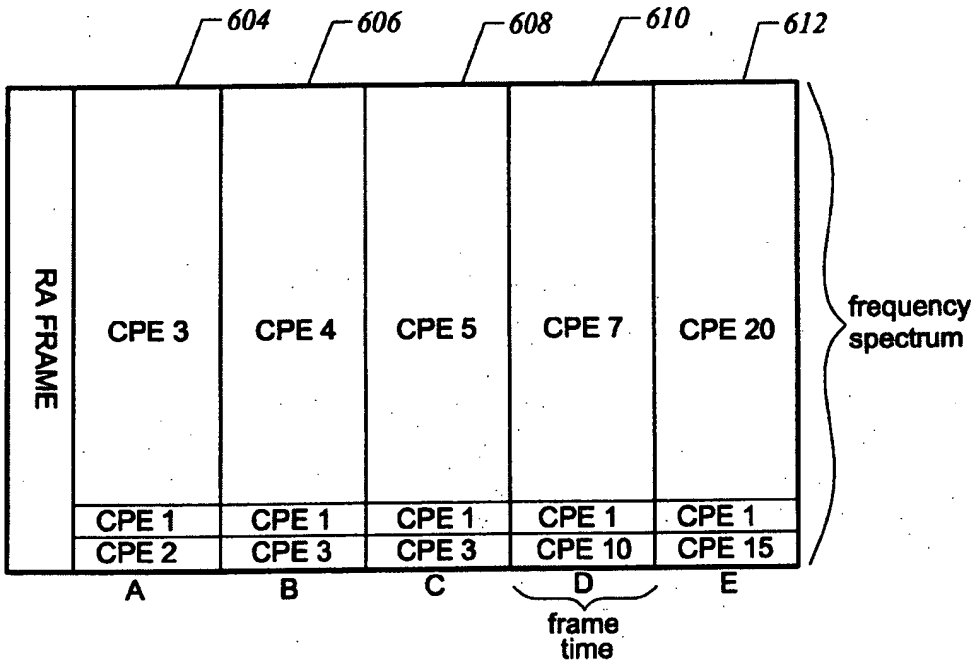

FIG. 4B

FIG. 4B of Raleigh et al., U.S. Patent No. 6,463,096

Referring to FIGs. 4A and 4B of Raleigh and related text, at any particular "frame time" one or more CPEs is allocated the "frequency spectrum". As the Examiner has noted, each CPE may be allocated between 2 MBPS and 30 MBPS of data rate (bandwidth) at any time. Thus, Raleigh discloses one technique for sharing frequency spectrum over time using a combined TDMA/FDMA modulation scheme. In particular Raleigh addresses MAC layer issues when using such a modulation scheme for both high data rate traffic and low data rate traffic. Raleigh provides no details regarding the content or structure of its frames, e.g., CPE 1, CPE 2, ..., CPE N over a frame time.

Claims 1, 8, 15, and 21-24 include elements relating to the structure of high speed data frames. Raleigh fails to disclose, suggest, or teach such elements of these claims. In particular, Raleigh fails to disclose, suggest, or teach that its TDMA/FDMA frame

structure includes: "a respective indication of at least one user terminal for which the at least one data communication is intended" or "a respective indication of at least one data rate of the high speed data frame" as required by claim 1. While the Examiner attempts to equate the RA Frame of FIG. 4A and 4B of Raleigh with these elements of claim 1, such comparison is incorrect. As Raleigh particularly pointed out at Col. 6, lines 44-46 of Raleigh, "[a] request access (RA) frame 402 is where individual CPEs may request access to the common transmission medium." The RA time period does not equate to a high speed data frame that carries indications of either "respective indication" of claim 1 but merely sets forth a time period during which the CPEs may request access to the common transmission medium.

Raleigh does not even address how notice could be provided to the serviced CPEs that they have been allocated time/frequency within the TDMA/FDMA frame structure. Raleigh does not disclose in particular what is contained in the transmissions using the described TDMA/FDMA frame structure of FIGs. 4A and 4B. Raleigh fails to disclose, teach, or suggest all of the elements of claim 1. Thus, Raleigh fails to render claim 1 unpatentable under 35 U.S.C. 102(e). Independent claims 8, 15, and 21-24 include limitations similar to those of claim 1. For these same reasons, Raleigh does not render unpatentable independent claims 8, 15, and 21-24.

Claims 6 and 13 are not unpatentable under 35 U.S.C. 103(a) over Raleigh in view of Love, further in view of Christodoulides.

Love is cited for teaching that a high speed data frame may include power control bits. Christodoulides is cited for teaching that a high speed data frame may include a

pilot signal. Neither of these references overcomes the shortcomings of Raleigh. Thus, the combination of Raleigh, Love, and Christodoulides fails to render claims 6 and 13 obvious.

Claims 3-5, 10-12, and 17-20 are not unpatentable under 35 U.S.C. 103(a) over Raleigh in view of Rydbeck,

Rydbeck is cited to for meeting elements relating to coding rates, modulation schemes, and Walsh coding. Rydbeck does not overcome the shortcomings of Raleigh. Thus, the combination of Raleigh and Rydbeck fail to render claims 3-5, 10-12, and 17-20 obvious.

Conclusion:

For the above-provided reasons, the Appellants respectfully request that the foregoing rejections be overturned and that the claims in the present application be allowed to issue.

RESPECTFULLY SUBMITTED,

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Copy of Claims

1. (original) A method for operating a base station to wirelessly transmit data communications to a plurality of user terminals on a single wireless carrier, the method comprising:

repeatedly and sequentially wirelessly transmitting time division multiplexed superframes to the plurality of user terminals, wherein each time division multiplexed superframe comprises a plurality of high speed data frames;

wherein each of the high speed data frames carries at least one data communication; and

wherein each of the high speed data frames includes:

a respective indication of at least one user terminal for which the at least one data communication is intended; and

a respective indication of at least one data rate of the high speed data frame.

2. (original) The method of claim 1, further comprising supporting a plurality of data rates within the high speed data frames of a single superframe.

3. (original) The method of claim 1, further comprising supporting a plurality of coding rates and modulation schemes within the high speed data frames of a single superframe.

4. (original) The method of claim 1, further comprising coding the superframes with a plurality of Walsh codes prior to their transmission.

5. (original) The method of claim 1, further comprising:

coding the data communications of a high speed data frame using a first coding type; and

coding the respective indicator of the high speed data frame using a second coding type that is different from the first coding type.

6. (original) The method of claim 1, wherein each of the high speed data frames further includes:

a pilot signal; and

a plurality of reverse link power control bits intended for the plurality of user terminals.

7. (original) The method of claim 1, wherein:

a high speed data frame includes both a primary explicit data rate indicator and a secondary explicit data rate indicator;

wherein the primary explicit data rate indicator indicates:

a user terminal of the plurality of user terminals for which a first portion of the high speed data frame is intended; and

a data rate for the first portion of the high speed data frame; and

wherein the secondary explicit data rate indicator indicates a user terminal of the plurality of user terminals for which a second portion of the high speed data frame is intended.

8. (original) A superframe embodied on a carrier wave that carries data communications intended for a plurality of user terminals, the superframe comprising:

a plurality of high speed data frames;

wherein each of the high speed data frames carries at least one data communication; and

wherein each of the high speed data frames includes:

a respective indication of at least one user terminal for which the at least one data communication is intended; and

a respective indication of at least one data rate of the high speed data frame.

9. (original) The superframe of claim 8, wherein each superframe supports a plurality of data rates.

10. (original) The superframe of claim 8, wherein each superframe supports a plurality of coding rates and modulation schemes.

11. (original) The superframe of claim 8, wherein the superframe is coded with a plurality of Walsh codes prior to its transmission.

12. (original) The superframe of claim 8, wherein:

the data communications of a high speed data frame are coded using a first coding type; and

the respective indicator of the high speed data frame are coded using a second coding type that is different than the first coding type.

13. (original) The superframe of claim 8, wherein each of the high speed data frames of the superframe further includes:

a pilot signal; and

a plurality of reverse link power control bits intended for the plurality of user terminals.

14. (original) The superframe of claim 8, wherein:

a high speed data frame of the superframe includes both a primary explicit data rate indicator and a secondary explicit data rate indicator;

wherein the primary explicit data rate indicator indicates:

a user terminal of the plurality of user terminals for which a first portion of the high speed data frame is intended; and

a data rate for the first portion of the high speed data frame; and

wherein the secondary explicit data rate indicator indicates a user terminal of the plurality of user terminals for which a second portion of the high speed data frame is intended.

15. (original) A method of operating a user terminal to wirelessly receive data communications on a wireless carrier, the method comprising:

repeatedly and sequentially wirelessly receiving time division multiplexed superframes from a base station, wherein each time division multiplexed superframe comprises a plurality of high speed data frames that are intended for a plurality of user terminals;

for each of the plurality of high speed data frames, receiving a respective indication of its contents;

for each of the plurality of high speed data frames, determining whether the high speed data frame is intended for the user terminal;

determining that a particular high speed data frame of the superframe is intended for the user terminal; and

receiving a data communication contained in the particular high speed data frame.

16. (original) The method of claim 15, further comprising:

determining a data rate of the data communication from an indication contained in the high speed data frame; and

receiving the data communication at the data rate.

17. (original) The method of claim 15, further comprising decoding at least a portion of the superframe with a plurality of Walsh codes.

18. (original) The method of claim 15, further comprising:

decoding the respective indication contained in a high speed data frame using a first coding type;

determining that the high speed data frame of the superframe is intended for the user terminal;

receiving a data communication contained in the high speed data frame; and

decoding the data communications of the high speed data frame using a second coding type that is different from the first coding type.

19. (original) The method of claim 15, further comprising:

receiving a pilot signal contained in the high speed data frame; and

receiving a reverse link power control bit contained in the high speed data frame.

20. (original) The method of claim 19, further comprising:

determining a channel quality indicator based upon the received pilot signal; and

reporting the channel quality indicator to a transmitting base station.

21. (original) A base station that acts as a transmitter to wirelessly transmit data communications to a plurality of user terminals on a single wireless carrier, the base station comprising:

an antenna;

a Radio Frequency unit coupled to the antenna; and

at least one digital processor coupled to the Radio Frequency unit that executes software instructions causing the base station to:

repeatedly and sequentially wirelessly transmit time division multiplexed superframes to the plurality of user terminals, wherein each time division multiplexed superframe comprises a plurality of high speed data frames;

wherein each of the high speed data frames carries at least one data communication; and

wherein each of the high speed data frames includes:

a respective indication of at least one user terminal for which the at least one data communication is intended; and

a respective indication of at least one data rate of the high speed data frame.

22. (original) A user terminal that acts as a wireless receiver to wirelessly receive data communications on a wireless carrier, the user terminal comprising:

an antenna;

a Radio Frequency unit coupled to the antenna; and

a digital processor coupled to the Radio Frequency unit that executes software instructions causing the user terminal to:

repeatedly and sequentially wirelessly receive time division multiplexed superframes from a base station, wherein each time division multiplexed superframe comprises a plurality of high speed data frames that are intended for a plurality of user terminals;

for each of the plurality of high speed data frames, receive a respective indication of its contents;

for each of the plurality of high speed data frames, determine whether the high speed data frame is intended for the user terminal;

determine that a particular high speed data frame of the superframe is intended for the user terminal; and

receive a data communication contained in the particular high speed data frame.

23. (original) A plurality of software instructions stored on a media that, upon execution by a base station, cause the base station to wirelessly transmit data communications to a plurality of user terminals on a single wireless carrier, the plurality of software instructions comprising:

a set of instructions executed by the base station that cause the base station to repeatedly and sequentially wirelessly transmit time division multiplexed superframes to the

plurality of user terminals, wherein each time division multiplexed superframe comprises a plurality of high speed data frames;

wherein each of the high speed data frames carries at least one data communication; and

wherein each of the high speed data frames includes:

a respective indication of at least one user terminal for which the at least one data communication is intended; and

a respective indication of at least one data rate of the high speed data frame.

24. (original) A plurality of software instructions stored on a media that, upon execution by a user terminal, cause the user terminal to wirelessly data communications on a wireless carrier, the plurality of software instructions comprising:

a set of instructions executed by the user terminal that cause the user terminal to repeatedly and sequentially wirelessly receive time division multiplexed superframes from a base station, wherein each time division multiplexed superframe comprises a plurality of high speed data frames that are intended for a plurality of user terminals;

a set of instructions executed by the user terminal that cause the user terminal, for each of the plurality of high speed data frames, receive a respective indication of its contents;

a set of instructions executed by the user terminal that cause the user terminal, for each of the plurality of high speed data frames, determine whether the high speed data frame is intended for the user terminal;

a set of instructions executed by the user terminal that cause the user terminal determine that a particular high speed data frame of the superframe is intended for the user terminal; and

a set of instructions executed by the user terminal that cause the user terminal receive a data communication contained in the particular high speed data frame.